SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1557.—Vol. XXXV.] LONDON, SATURDAY, JUNE 24, 1865. STAMPED.... SIXPENCE. UNSTAMPED. FIVEPENCE.

THE LEAD MINES OF THE SOUTH OF SPAIN.

[Abstract of a Lecture delivered at the Royal School of Mines, Jermyn-street, by Prof. W. W. Smyth, F.R.S., &c.]

In investigating the history of the civilised world, if we go back to those old fathers of history, such as Herodotus, Theocrates, Pliny, and others, who have furnished us with descriptions of the sources of metallic supplies of the times in which they lived, we find they all pointed to great centres from whence were derived, not only a sufficiency of the precious metals, but also of those commonly spoken of by us as the base metals. And as if a superior power to that of human agency directed the course which the stream of civilisation should follow, it is curious to observe that the great centres of production were to the westward of the earlier seats of civilisation. Thus at the period during which the Greeks and Romans figure as masters of the then known world Spain is pointed out as the great seat of mining enterprise. From thence flowed to the East gold, silver, copper, and tin, in such quantities as enriched at one time the Carthaginians, at another filled the Romans' coffers, which latter worked the mines of Spain vigorously, under their notorious consuls and proconsuls. With the decline, however, of the Roman power came also the decline of the Spanish mines, and with the inroads of the Northern hordes these mines sunk into insignificance, and almost into oblivion; and it is only as it were to-day that they have again sprung into importance and vigorous working condition.

Let us transport ourselves in imagination to the district of these mines, and take our start from the capital of Spain. There—that is, in the neighbourhood of Madrid—the climate is very variable, it being extremely hot in summer, and proportionately cold in winter. On journeying southwards from the capital, the traveller passes from a comparatively northern climate to more tropical regions, and the first great landmark he comes to is the chain of mountains called the Sierra Mancha. Continuing in this same direction, he arrives at the Sierra Morena, after crossing the Sierra Mancha, and there he finds the climate essentially tropical. Passing, again, over the high ground he reaches a barren, sandy district, stretching away to the neighbourhood of Linares, the centre of one of the great lead mining districts of Spain. The mines of this district are situated in a low range of granite hills, and occupy an area some eight miles long by six miles wide. The neighbourhood is a dangerous one to live in, being but thinly populated, and consequently but badly supplied with the necessaries of life, besides possessing an unhealthy climate. The lead is found in veins running north and south, their course and position being distinctly indicated by the number of small hillocks of sand and stone thrown out from the tops of the veins by those who, like the present owners, worked them for the lead they contained. No soil covers the old workings, and so they are doubly distinct from there not being a trace of vegitation on them, the country on either side being more or less green.

The mines of Linares, like all others in Spain, date their present workings from about the year 1839. Before that time all minerals, of whatever kind, and wherever found, within the kingdom, were the property of the Crown, so that no mines could be worked but by the Government. Hence resulted, as might reasonably have been expected, a dwindling down of the number of working mines, and a slovernly mode of conducting those in operation. Finding, then, the fallacy and loss to the State by this exclusive system, the Government relinquished their right to all the mineral produce of the country, throwing the privilege of working the deposits open to adventurers from all parts, and retaining alone the right to exercise a supervision in the workings, and to impose small dues. The laws which were then prepared to regulate the mines have certainly opened the door to considerable dishonesty and bribery; but, on the whole, it must be allowed the system works well. Amongst others there is a law which gives any explorer the right on discovering a vein to apply to the officer of the district for permission to work on it, over an area 300 yards long by 200 yards wide; and provided a claim has not been already lodged to the same spot the applicant can enforce his right. For the grant of such a piece of ground, as mentioned, the miner pays a small fee, and an annual rental whilst he works the mine. Besides this, Government obliges him to make a certain amount of exploration each year, and if he abandons his workings for six months the area may be re-let to any other applicant.

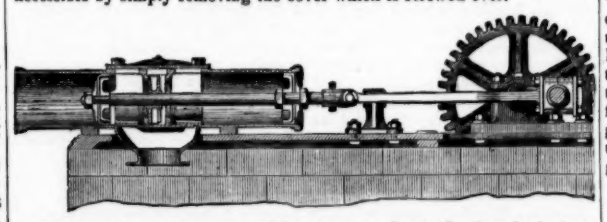
As was natural, the sudden throwing open of the Spanish mines to all adventurers at first induced a great deal of rash speculation, which resulted in nothing but loss. This, however, was rather a feature of the earlier days of the district, for all such unwholesome schemes have long since disappeared, and now capital, being carefully and properly invested, has led to many most successful enterprises. One of the most remarkable of the remunerative mining schemes in Spain is that of the Linares Mining Company, an English company, who about 14 years ago bought up a range or old workings for 200*l*. In plant, machinery, and exploring this company spent nearly 30,000*l*., a capital which for some time seemed sunk, without any probability of a return. Success, however, at last rewarded their perseverance and energy, and this same company has since divided amongst its shareholders the enormous sum of 150,000*l*. The veins of the district of Linares are very variable in their yield, being sometimes very rich at others very poor. The mines are worked to a great extent by the inhabitants of the district, although a good many English miners have been lately taken out by the English companies. Wages in Linares are pretty much the same as in our English mining districts; for example, a good working miner gets there, as here, 2s. 6d. per diem. The two systems of payment, known in our Cornish mines as those of tutwork and tribute, are also common in all Spanish mines. Living at Linares is very expensive, house rent is enormously high, and so natives, accustomed to the great variations in climate, and not requiring the same amount of animal food as Englishmen do better than English miners. Coals cost 4*l*. 4s. per ton, wood is tolerably cheap, but all kinds of victuals are dear. All the miners work eight hours a day, and the natives are a hard-working race of men; unfortunately, however, they are pasionately addicted to change, and directly they have saved from their earnings a small sum they start away to the towns to spend it, not returning until it is all exhausted. This erractic disposition is pecularly troublesome to the managers of the mines, who are compelled to continually replace the old hands by new ones.

The whole of that district lying between Linares and the South coast of Spain would resemble Africa in its extreme barrenness, if it were not for the range of coast mountains known as the Sierra Nevada, which break the monotonous desert. These lofty mountains rise to a height of 11,000 ft., and feed several large rivers, which flow inwards and westwards, and in irrigating the lines of country through which they pass produce the only vegetation which varies the arid land. Access to the coast from the mines is most difficult, for the traveller, after leaving the beautifully irrigated plains of Granada, finds no road across the lofty coast mountains, and the only path open to him is that along the old river beds. Tracking his way by these, he reaches the mountains, and having surmounted their cresta, on his road to the coast, journeys down over a series of low ranges of hills, until he comes to the well irrigated coast plains, covered with palms and tropical vegetation.

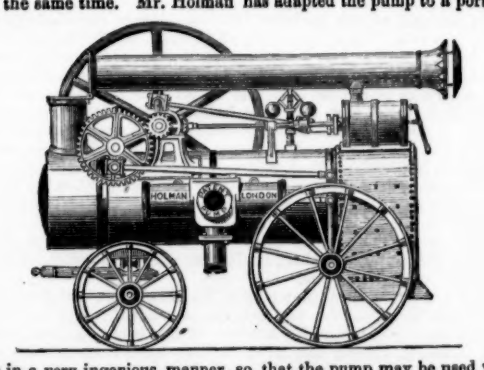
It is down on the coast side of the Sierra Nevada, and just below a smaller range of limestone mountains, which rise to a height of 7000 feet above the sea, that the Albural smelting-works are. At these works is smelted a large quantity of lead, and the position has been chosen partly because it is a mining centre, partly because there is near it a supply of flux and fuel, and partly because it is accessible to the coast. Between these works and the other districts may be at all times seen long strings of mules laden with lead ore to be smelted. Physically the position of the smelting-works is a most miserable one; there is no water in the neighbourhood, and not a trace of vegetation, so that everything for the sustenance of man and beast has to be brought there. Still, despite the disadvantages of a bad climate, and despite the natural indolence of the Spanish race, their mines are now of considerable importance, and are likely to increase still further in notoriety as sources of metallic produce.

IMPROVEMENTS IN PUMPS.

The advantage to be derived from a thoroughly efficient Double Acting Pump may be fairly judged of by the many attempts that have been made to produce one, and the very varying forms in which they are constructed. Amongst the most recently introduced may be mentioned the double-action cannon pump, patented by Mr. S. Holman, of Cannon-street, which has the advantage of throwing a large body of water, and affording the greatest possible facility for getting at the valves. The pump consists of a simple cylinder, open at both ends, and provided with two pistons, so placed that when the one is at the extremity of the cylinder the other is near the centre, ready to commence the outward stroke. The inward stroke of each piston terminates some short distance from the centre, the vacant space thus left being occupied by the inlet and outlet valves, which are thus constructed:—The space is divided into three portions by two internal rings, between which is a loose collar on the piston-rod, closing against one or other of the rings, according to the direction in which the pistons are moving. The outer portion of the vacant space is furnished with suitable inlet valves, whilst the centre of such space is in communication with the delivery pipe, the whole of the working parts being readily accessible by simply removing the cover which is screwed over.



The working of the pump will be at once understood; there is, in fact, a pumping chamber at each end of the cylinder, the central valve forming the bottom of each chamber during the inward stroke of the piston, and allowing the water to escape between the valve and the second internal ring. It is considered that a 3-in. pump, with 6-in. stroke, which is supplied with the necessary crank on bed plate for 20*l*., will pump 1500 gallons per hour, whilst a 12-in. pump, with 12-in. stroke, will yield 20,000 gallons in the same time. Mr. Holman has adapted the pump to a portable



engine in a very ingenious manner, so that the pump may be used when necessary, and almost instantly detached when the engine is required for other purposes. The piston-rod of the pump is attached near the end of a lever, the fulcrum of which is the axle of the hind wheels of the portable engine, the end of such lever communicating through a connecting rod, with a wheel geared to a pinion on the driving-shaft. There are a large number of purposes to which the pump is applicable, a description of its various modifications being given in the illustrated catalogue which Mr. Holman has just issued, and from which the above diagram is extracted.

Artificial Fuel.—An invention has been patented by Mr. David Barker, of Battersea, which relates to certain improvements in the treatment of coal, coke, peat, and charcoal,—the main object being to utilise those substances, when in a state of powder or minute division. Coal of any description, whether bituminous or non-bituminous, as well as the other substances before mentioned, may thus be used for the production of fuel, possessing all the qualities of the articles employed when existing in a more marketable condition. In order to produce cohesion between the particles or pieces of the materials under treatment, they are mixed with a compound formed of farinaceous matter, lime water or yeast, or water and a solution of potash, such last-mentioned materials being combined in about the proportions of one part of the farinaceous matter to four parts of lime water or yeast, or water and one-thirtieth part of potash in solution, the mixture being then diluted with water as may be desired. The coal or other material under treatment having been mixed with the compound last described is formed into blocks and subjected to the desired degree of pressure, by means of any of the known machinery or apparatus applicable to such purposes. Instead of the farinaceous matter being mixed with the other ingredients of the said compound in the first instance, the coals or other substances of which the fuel is to be formed may be washed or mixed with a compound of lime water or yeast, or water and potash, and the farina mixed in a dry state with the coal or other substance under treatment, pressure being then applied as before mentioned.

ECONOMIC GENERATION OF STEAM.

A highly ingenious apparatus for controlling the draught in steam-boiler furnaces has been extensively introduced, under the designation of the Improved Steam Damper, amongst engineers, gas companies, brewers, steam-mills, &c., by Messrs. Barrett and Co., of Gracechurch-street; and there can be no doubt that its simplicity, efficiency, and economy render it well worthy of the attention of those who employ steam-power for mining purposes; it is an arrangement by which the fire is regulated to the greatest nicety, by the action of the steam itself upon the damper. The steam is conveyed by an ordinary pipe into a small cylinder, which is closed by a flexible diaphragm. Upon this diaphragm a small plunger is placed; this is pressed upon by a weighted lever, in communication with the damper, which is fitted in the flue, at an angle of 45°, so as to open and closed with the greatest rapidity. The spindle rolling in oblong slots on V-edges, all friction is avoided, and all parts of the machine being made to work on steel centres, with V-edges, its action is most sensitive. As the pressure of the steam beneath the diaphragm increases the lever is raised and the damper gradually closed, the pressure of steam which shall act upon the damper being regulated precisely in the same manner as a safety-valve.

Amongst the advantages claimed for the apparatus are its simplicity of construction, the facility with which it can be affixed to any boiler now in use, and its non-liability to derangement; its action is constant and gradual; it saves a large percentage of fuel, by controlling the draught, checking the combustion, and holding under the boiler a large amount of heat which would otherwise escape directly up the flue; a perfectly even pressure of steam is secured, whilst the stoker is relieved from a great measure of responsibility; it is likewise regarded as a great safeguard against explosion, preventing the generation of more steam than is desired, and preserving the boiler from undue pressure; the steam controls the damper, which, by checking the fire, in turn controls the steam. The inventors have received a large number of certificates of efficiency from those who have had them in use, and amongst them we notice particularly those from Messrs. John Penn and Son, who write, after having the dampers "in constant use for upwards of five years," that they continue to work well, and give them every satisfaction; and from Mr. Joseph Newton, the foreman of the Coining Rooms, at the Royal Mint, who after six months' trial, writes:—"I have to report that your steam regulator, as applied to the boiler of our 30-horse power rolling-mill engine, in July last year, continues to give us the most complete satisfaction; it is at once economical and efficient. I can have no hesitation, therefore, in recommending its use wherever, from the varying load upon an engine, the fluctuations of steam-pressure on the boilers are great and sudden. We are enabled to work our Juckes's furnace with a thinner feed than before the application of your steam regulator, thus palpably exhibiting a saving of fuel, which we doubt not we under estimate when we say that it is at least 10 per cent., whilst the engineman has less work."

Improving the Strength of Iron.—A new composition, the addition of only a small percentage of which to cast-iron has a marked effect upon its quality, has recently been tested in America at the Morgan Ironworks and Wiard Ordnance Works, and very satisfactory results obtained. Prof. Fleury, whose name is already known to the readers of the *Mining Journal* as a sound practical chemist, has witnessed the experiments, and states that the new process consists in liquifying a certain alloy, and adding about 6 per cent. of the same to the melted cast-iron. About 200 lbs. of common foundry cast-iron was poured from a large reservoir into a ladle, and then subdivided into equal portions, about 100 to each, poured into two smaller ladles. The alloy had been previously melted in a crucible in the brass foundry, and while yet liquid and highly heated added to the iron in one of these smaller ladles. To prevent the flying of sparks, a conical-shaped cap, with a stove-pipe extending about 6 ft. upwards, was placed upon the ladle, and the alloy, through a lip opening on the side of the cone, poured into the molten pig-iron. A small quantity of borax, as a flux, was also thrown on the surface of the iron. A puff of white vapour, accompanied by a flame of yellowish-red colour, mixed with a few flames of white-bluish hue, rose rapidly from the surface of the pig-iron, which for a moment boiled up, but quickly subsided. The two ladles, of which one contained the alloy, while the other was left without it, were then emptied at the same time into the previously prepared sand moulds. The treated iron exhibited a much greater fluidity, and cooled more gradually than the iron that contained no alloy. After the pieces in the moulds had sufficiently cooled, the writer had a few of them broken, and compared their texture. A remarkably close, compact, and uniform texture throughout the entire mass distinguishes this iron at once from that containing no alloy, which latter was coarser grained in the centre, while the grain of the former was uniform all through. The side of one of the treated square pieces filed and polished exhibited a beautiful steel-like lustre, without any imperfection. The tensile strength of two pieces, one of which had been prepared by the new process, was afterwards tested at the United States Cannon Foundry, at Cold Springs, New York, when it was found that the treated piece broke at 21,200 lbs., whilst the untreated piece stood only 12,000 lbs., showing the process to have improved the quality by 9200 lbs. A comparative test on two pieces of the same kind of iron of which one had been treated with various acids and salts exhibited a remarkable difference in favour of the treated iron, which was very little acted upon when compared to the rapid corrosion of the other. The strengthened pieces were remarkably malleable and tough, requiring repeated hard blows of the hammer before breaking. They were easily filed and drilled. With regard to the theory of the process, it is considered very probable that by the infusion of the metals of the alloy into the cast-iron the pores and interstices which exist between the molecules of iron are filled up, and cause a more regular and closer contraction while cooling. It might also be stated that the zinc of the alloy, finding some carbonic oxide in solution, decomposes the same, and causes the boiling up of the iron. The yellowish red flame issuing from the iron while the alloy is added is a most remarkable incident, and a thorough chemical analysis to ascertain the quantity of carbon contained in the strengthened iron would throw much light upon the subject.

Silvering.—Cold silvering may be performed on brass and copper which is well cleaned and quite bright, by rubbing with a moistened cloth dipped in the following powder:—1. Chloride of silver 2 parts, pearlash 6 parts, salt 3 parts, whiting 2 parts; mix. When the metal is silvered it should be washed in a hot weak solution of alkali, and then wiped dry. Other silvering powders are:—2. Nitrate of silver and salt, of each 1 part, cream of tartar 7 parts. 3. Nitrate of silver 1 part, cyanide of potassium 3 parts. 4. Bath, nitrate of silver 15 parts, sulphate of soda 100 parts; dissolve in water, and dip the article into the solution.

Railway Carriages.—Capt. C. Claxton, R.N., of Park-road, Brompton, has patented an improved means of connecting the compartments of railway carriages. He proposes the perforation of the partition in the manner usually suggested, but instead of glass, &c., as proposed by prior inventors, he employs fine wire gauze—too fine to permit the passage of ordinary conversation, but coarse enough to pass screams. We have referred to the model of this invention exhibited at the Polytechnic.

THE ATLANTIC AND GREAT WESTERN RAILWAY.

The accompanying letter and report received from Mr. Moseley, who has recently visited the United States, and minutely inspected the Atlantic and Great Western Railroad, will, we think, prove interesting to holders of this company's securities, showing, as it does, the great variety of the sources from which traffic will be derived, and the vast amount which must immediately accrue and will ultimately swell into an aggregate equal to, if not greater than, that of any railroad of similar length in any part of the world :—

New York, May 29th, 1865.

Edward F. Satterthwaite, Esq., London.

Dear Sir,—In accordance with your instructions, I have made a careful examination of the Atlantic and Great Western Railway, and also of the lines connecting with it at Dayton, and on to St. Louis.

The main line commences at Salamanca, on the Erie Railway, 414 miles from New York, in the State of New York, and passes through the States of Pennsylvania and Ohio, terminating at Dayton, a total distance of the 386 miles.

The broad gauge lines in direct communication with the Atlantic and Great Western are :—

	Miles.
The Erie Railway, New York to Salamanca	414
The Cincinnati, Hamilton, and Dayton Railway	60
The Ohio and Mississippi Railway	340

The railroad crossings and connections of the line are as follows :—

At Salamanca	with	Erie Railway	414
Corry	,,	Oil Creek Railway	34
		Philadelphia and Erie Railroad	451
Meadville	,,	Franklin and Oil City Branch A. and G. W. Railway	37
Cleveland	,,	Cleveland and Toledo Railroad	112
Greenville	,,	Erie and Pittsburgh Railroad	148
Ravenna	,,	Cleveland and Pittsburgh Railroad	150
Akron	,,	Cleveland, Zanesville, and Cincinnati Railroad	87
Mansfield	,,	Pittsburgh, Fort Wayne, and Chicago Railroad	258
		Sandusky, Mansfield, and Newark Railroad	116
Galion & Marion	,,	Cleveland, Columbus, and Cincinnati Railroad	258
		Bellefontaine Railway	469
		Great Central Railway	188
Urbana	,,	Sandusky, Dayton, and Cincinnati Railroad	215
Springfield	,,	Springfield and Columbus Railroad	45
		Springfield, Mount Vernon, and Pittsburgh Railroad	
		Sandusky, Dayton, and Cincinnati Railroad	
Dayton	,,	Dayton and Michigan Railroad	207
		Indiana Central and Dayton and Western Railroad	57
Cincinnati	,,	Ohio and Mississippi Railroad	340
		Indianapolis and Cincinnati Railroad	115
		Kentucky Central Railroad	112
		Louisville and New Orleans Steamers	

It affords me much pleasure to be able to report that the Atlantic and Great Western line is in most excellent order, the ballasting good, and, with the exception of some twenty miles of metal west of Salamanca, the rails are in first-rate condition. These twenty miles are now being relaid with new iron, the rails taken up will be used for additional sidings about to be built at important points on the line, and which, when completed, will amount to about fifteen miles in length.

It is also most satisfactory to be able to confirm the report I made to you in March last, that during the great floods the lines escaped wonderfully, the amount of damage done to the permanent way and bridges being but trifling, and that all repairs were executed within a week by the ordinary staff of "track layers." The stations on the line at present are of course more or less of a temporary character, with the exception of Meadville, the head-quarters of the company, a very fine building, containing the offices for the various departments, refreshment rooms, and in addition a large first-class hotel (admirably managed), but still far too small to accommodate the greatly-increasing business. In due time great alterations and additions will be made to all the stations, but at present they are well adapted to the traffic, and it is policy to thoroughly develop the traffic before expending large sums upon improvements, that in the course of a year or two are sure to prove inadequate. There are in course of construction at Meadville large workshops and engine-sheds, which, with the houses belonging to the company, and rented by *employés*, cover an area of about sixty acres. At the Kent station there are also large works being erected, consisting of car and smiths' shops, and engine-sheds, all being built in a most substantial manner.

All the heavy works now in hand are being pushed on with vigour, more especially the engine-sheds, which will be completed before the coming winter.

The rolling stock consists of—

91	Locomotives on line.
35	,, building.
51	Passenger cars (to carry 60 persons).
40	,, ,, building.
16	Baggage and Mail cars.
2,566	Freight cars.

It is all in splendid order, the engines being of a particularly fine description.

From Dayton to Cincinnati the line belongs to the Cincinnati, Hamilton, and Dayton Railway Company. The company expended 1,500,000 dols. in laying a broad gauge "straddle" track (rails on either side of narrow gauge rails), and building passenger stations and freight houses to accommodate the Atlantic and Great Western traffic. The passenger station at Cincinnati is one of the best and most convenient in the States, containing arrangements for the comfort of passengers not usually to be met with on American lines. A fine suite of offices are nearly completed for the use of the Atlantic and Great Western Company. The freight houses adjoin the station, and are rented by firms who take the freights from the railway company, charging for storage, and assuming all the responsibility of delivery ; an excellent arrangement, that relieves the company of a vast amount of risk. The line from Dayton to Cincinnati is in perfect order, is well ballasted and maintained, the stations are good, and there is every facility for conducting a very large traffic with regularity. The junction with the Ohio and Mississippi Railway is about half a mile from the main station. Arrangements are contemplated by which the two lines will unite at the main station. The line to St. Louis, considering the severe winter and the floods, is in very good condition. The track is being carefully repaired, and a large amount of iron is being re-rolled and relaid. It is the intention of the directors to re-roll nearly all the metal now down. The line is broad gauge throughout.

The Franklin branch has been extended from Franklin to Oil City, 8½ miles, a very important addition to the line. From Meadville to Franklin the rails originally laid are very light, but from the fact of the joints being fished, they have worn most surprisingly well, and would last for years to come. However, it is intended to replace them with the same description of rail used on the main line. The light rails will be kept in stock, in all probability, for sidings. The track is well maintained, and the enormous traffic over this branch is admirably managed.

The Cleveland Extension runs over the Mahoning railway (leased by the Atlantic and Great Western Company for 99 years), and is a "straddle" track ; the narrow gauge cars and engines belonging to the Mahoning line are, therefore, used in common with the broad gauge, trains of the mixed gauges being run with the greatest safety. The line is in splendid order, and the traffic over it immense.

The works on the Buffalo Extension and New Lisbon Coal Branch will be energetically carried on. Those on the Erie and Niagara line are nearly complete.

Having thoroughly satisfied myself that the lines now in operation are in proper order, I have devoted considerable time to ascertaining what are the traffic prospects for the future. I append a return of the towns and villages within a radius of about twenty miles from the main line, from which it will be seen that the railway passes through settled and populous districts. In fact, from Saegar Town (97 miles from Salamanca), west, the country is as highly cultivated as any part of the States.

I am prepared for somewhat lower traffic receipts for the *summer* months of this year, and believe that they will be lower than at any future period, for the following reason : The heavy decline in the Eastern markets (consequent upon the large fall in gold) in the value of Western products, such as tobacco, grain, hemp, and hogs, has almost stopped shipments to the seaboard, holders generally hoping for a reaction in prices, and as a rule being unwilling to face a sudden loss. All this freight is in the West, and sooner or later must come East. If held back until the harvest there will be an immense pressure of freights, and the roads will be enabled to advance their rates.

The connections with the various cross-roads are highly important, and when arrangements are completed for additional sidings, transfer houses, &c., will open up to the Atlantic and Great Western at points such as Corry, Clarkesville, Mansfield, and Galion, feeders fully as valuable as any now in existence, and in addition a class of traffic that hitherto has not been sought after ; I mean the stock traffic. Dull as this branch of trade is at the present time, a neighbouring line for instance is carrying from forty to fifty cars per diem. This at 30 dols. (a minimum rate) gives upon the lower number 1,200 dols.

I anticipate that the Atlantic and Great Western will obtain about the same traffic in dull times from Cleveland to Salamanca. The amount of stock, however, to be conveyed from Cleveland will not compare with that which will be forthcoming from Mansfield, Galion, Urbana, and Dayton. The States of Kentucky, Southern Illinois, and Missouri, are the great stock-producing States, and the Atlantic and Great Western line from these points (arrived at by the Ohio and Mississippi, Cincinnati, Hamilton, and Danton, and Cincinnati and Indianopolis, and other lines) offers to stock producers an unbroken broad-gauge line to New York. It is a fair calculation to estimate the stock traffic over the south-western portion of the road at from 50 to 100 cars per diem. Taking the lower figure at an average of 50 dols. to 75 dols. per car, and the lowest rate you have 2,500 dols., which added to the Cleveland estimate of 1,200 dols., gives a total of 3,700 dols. per diem, or 22,200 dols. per week of six days for stock traffic alone.

A great source of traffic at present is, and will be, for many years to come, the oil from the Pennsylvania wells. Notwithstanding the enormous yield for the last three years, the supply shows no sign of exhaustion, and, as a consequence, fresh adventurers are daily arriving and expending capital in the hope of "striking oil." The large number of companies formed of late has increased the value of land to an enormous extent, and materially added to the traffic on the Franklin branch. It is estimated that nearly 2,000 fresh wells will be started this season ; the pumping engines for these new undertakings are scattered in all directions—200 were on the Franklin platform at one time last week. The extension of the line to Oil City will necessarily secure an immense amount of oil traffic, that last year was transported East by other routes. A large plot of land has been presented to the company in the neighbourhood of Oil City, on the river bank, upon which large wharves and sheds will be built exclusively for Petroleum traffic. The oil will be sent direct from the wells on the creek to these landings, and as a saving of some seven miles of road hauling will be effected, it is fair to suppose that a large amount of traffic that has hitherto gone by river will be diverted to the rail. The number of barrels transported by the Atlantic and Great Western line last year amounted to the enormous number of 675,028.

Coal in the course of a very short time will form one of the largest items of traffic. The facilities for shipment at Cleveland are so great (the Company having between 3,000 and 4,000 feet of river frontage) for the West *viâ* the lakes and railways, that it is impossible to estimate what the value of this traffic will be. At present it is only beginning to be developed. In addition to the Western shipments, there will be an enormous demand for Canada, *viâ* the Buffalo Extension and Erie and Niagara line. Cheap coal is sure to bring a large number of manufactories to the towns in the neighbourhood of the coal fields. It is a satisfactory feature that the trucks running from Youngstown (the southern terminus of the Mahoning branch, and centre of the coal district) to Cleveland, return with iron ore from Lake Superior. The "Mahoning Works," at Youngstown, consume when in full work 240 tons of coal, and turn out, in bars, sheets, and spikes, 50 tons of iron per day. The freight business of these works in ore from Cleveland, and manufactured iron to different parts, is worth 105,000 dols. per annum. Two other firms here contribute 75,000 dols. each per annum, and others from 50,000 dols. to 60,000 dols.

In addition to the sources of revenue alluded to, there is a very large and well-paying freight traffic at present derived from dairy produce, which commands a higher rate for transport than any other description of freight.

Upon the line being fully open to Cincinnati and St. Louis for through traffic, I have no doubt that the most sanguine expectations will be fully realised. At present, owing to the want of rolling stock, through freights have not been canvassed for. One through train per day began to run on the 8th instant, another will be placed on the line by the middle of June, and a third by the middle of July. The opening of the through line for passengers will, however, serve as an advertisement for freights, and as new cars are added to the stock now running, energetic measures will be taken to secure a class of traffic hitherto not competed for—viz., general merchandise bound west. There is also a large amount of goods traffic to be obtained from the Cleveland and Toledo and Michigan lines, running from Toledo to Chicago. The Toledo line will be in a position to give more than double the amount of freight for conveyance east compared with the total now carried for them over the Atlantic and Great Western. The relations between these lines and the Atlantic and Great Western are of a very friendly nature, and there is an evident anxiety on the part of the managers to assist in developing the Atlantic traffic. It is also gratifying to be able to report that both at Cincinnati and St. Louis, all the railway authorities I had the pleasure of meeting spoke in the most encouraging manner of the traffic prospects, and expressed themselves highly satisfied at the probable early opening of the through route. Apart, however, from all questions of through traffic, I am convinced that the local traffic alone (which up to the present time has been the great source of earnings) by good management and development will yield a revenue more than sufficient to meet the requirements of the bondholders. No new line ever built in the United States passes through more highly-cultivated or better-settled districts, which from the very first have thrown an immense amount of traffic upon the line.

When it is considered that this great railway was only commenced about five years ago, during a period of civil war, when labour was scarcer, and wages higher, than ever remembered, I think the stock and bondholders may fairly congratulate themselves upon the results obtained up to the present time. To the amazing energy of Mr. Kennard, the engineer in chief, in the face of every possible opposition, these results are mainly due.

Under the active presidency of Mr. L'Hommedieu, and the management of Mr. McLaren, the General Superintendent, there is no doubt that vast improvements in the conduct of the traffic generally will be made. Indeed, already important savings have been effected in the working expenses of the road. Both these gentlemen speak most confidently of the success of the undertaking, and of the large increase in the receipts that must follow upon the perfect equipment of the line.

The following are the stations on the Atlantic and Great Western line, with the towns and villages alluded to.—I am, dear Sir, yours faithfully,

EDWARD MOSELEY.

The number of miles, after the name of the station, gives the distance of each place from SALAMANCA, which is the connection with the Erie Railway and transfer station, situated in Cattaraugus County, New York ; population of the county is 43,735.

STEAMBURG (12 miles). A small place ; lumber is the principal business derived from this station.

RANDOLPH (18 miles), population 1,500 ; Rutledge, 5 miles from the station, population 500.

KENNEDY (25 miles), population 1,200 ; Ellington, 12 miles from station, population 1,200.

JAMESTOWN (34 miles), population 5,000 ; important manufacturing and shipping point. Towns tributary thereto—Bucklands, 500 ; Busti, 400 ; Frewsbury, 600 ; Ellery, 400 ; Fentonville, 400 ; Kyantone, 500 ; Russellburg, 600 ; Sugar Grove, 1,000 ; Geary, 500 ; St. Clairsville, 1,200 ; Stockton, 700 ; Mayaville, 1,500. These towns are 5 to 20 miles from station in Chautauqua County, the population of which is 58,337. Road passes through south part of county ; Lake Shore Railroad, distance 16 miles. There is a pleasant route to the Lake Shore line at Westfield, 57 miles east of Buffalo, *viâ* steamboat on the Chautauqua Lake to Maysville, and thence by coach, 7 miles to the railway ; this route is much frequented in the summer months.

ASHVILLE (41 miles), population 1,000.

PANAMA (48 miles). Town of same name distant two miles ; population 1,200.

COLUMBUS (57 miles), population 800 ; in Warren County, Pennsylvania, population of which is 19,190.

CORRY (61 miles). This town is five years old, population 4,000. Crossing of the Philadelphia and Erie Railroad, and Junction with the Oil Creek Railroad, an important point for forwarding oil, and receiving merchandise and machinery for the oil regions. Here are the Downer Oil-refinery Works, containing iron tanks which hold 10,000 barrels of oil. In 1860 the site of Corry was a forest, not a house to be seen.

CONCORD (66 miles). A small village.

MILL VILLAGE (79 miles). Only a station, no village of any consequence. Waterford, 4 miles, population 4,000. Philadelphia and Erie Railroad runs directly alongside Atlantic and Great Western road from this station to Corry.

MILLERS (85 miles). Small place.

CAMBRIDGE (88 miles), population 2,000. Endenboro, 6 miles, population 600.

VENANGO (92 miles), population 1,200. Rockville, 8 miles, population 1,000.

SÆGER TOWN (97 miles), population 500. From this station, west, a marked change is visible in the country ; up to this point there is much forest land, and the resources of the country are undeveloped. Still, much has been done during the last four years, and a daily improvement may be expected.

MEADVILLE (103 miles), population 8,000 ; important commercial and manufacturing town. General offices of the railway are at this place, and a large and admirably managed hotel, the "McHenry House," where passengers dine, &c.—indeed, if it were twice the size it would always fill. Eight distinct table d'hôte dinners are served here for the convenience of persons living in the house, and passengers arriving by the trains. The Company's workshops are in a forward state, and will be of great service when completed. Tributary towns—Riceville, 18 miles, population 1,000 ; Cooley, 12 miles, population 500 ; Conneaut Lake, 7 miles, population 600 ; Cochranton, Utica, Evansbridge, Sugar Creek, small villages on Franklin Branch, which joins the main line at Meadville, in Crawford County, the population of which is 48,755.

FRANKLIN (131 miles), on the branch from Meadville, population 5,000. Great point for the shipment of oil. This station is at the junction of French Creek and Allegheny River.

OIL CITY, 8½ miles from Franklin, furnishes a great amount of traffic in passengers and freight to the road, population 10,000 ; situated at the junction of Oil Creek with the Allegheny River. In the spring and fall, when the water is high, but before the opening of the line to Oil City, most of the oil went down the Allegheny to Pittsburgh, and thence east. In the summer, when the water is low, and all through the winter, all the oil comes over the Franklin Branch.

SUTTON (110 miles). No village, but a good lumbering point.

EVANSBURG (115 miles). Town of same name is 4 miles from station, population 800. Hackstown, 5 miles, population 500 ; Georgetown, 10 miles, population 700.

ADAMSVILLE (121 miles). Population 500.

SUGAR GROVE (124 miles). Small station.

GREENVILLE (129 miles). Population 4,000. Tributary towns—Miner, 15 miles, population 2,000 ; New Hamburg, 7 miles, population 600 ; Delaware Grove, 9 miles, population 100 ; Centreville, 28 miles, population 200 ; Balm, 25 miles, population 100 ; New London and Maysville, population 100 each ; Shackleyville, 10 miles, population 600.

CROSSING OF ERIE AND PITTSBURGH RAILROAD (132 miles).

CLARKSVILLE (136 miles). Population 1,000. The Erie and Pittsburgh runs parallel with Atlantic and Great Western track 8 miles. Tributary towns—Newcastle, 17 miles, population 3,500 ; Pulaski, 10 miles, population 800 ; West Middlesex, 20 miles, population 1,000 ; Sharon, 8 miles, population 1,500 ; Jamestown, 10 miles, population 1,000 ; Brownsville, population 300 ; Lindenville, population 200 ; Espyville, population 200 ; Conneautville, population 1,500 ; Linesville, population 200.

CRAWFORDS (139 miles). Large coal fields at this point.

ORANGEVILLE, OHIO (141 miles). Population 1,200. Tributary towns—Sharon, 7 miles, population 5,000 ; Hartford, 4½ miles ; Vernon, 4½ miles ; Kinsman, 4½ miles ; Maysville, 5 miles ; Sharpeville, 5 miles.

The above-mentioned towns have a population of from 500 to 1,000 each.

BURGHILL (145 miles). Tributary to this station are the above-named stations, under head of Orangeville.

Large dairy farms are along the line of the road between this station and Akron, and consequently large shipments of butter and cheese are made from these points. The amount varies from 500 to 1,200 tons per annum from each station.

JOHNSON'S SUMMIT (149 miles). Fowler, 5 miles from station, population 700.

The remarks appended to Burghill station apply to this station equally as well.

BACONSBURG (154 miles). Population 500. Mecca, 7 miles, population 1,000 ; Johnson's, 6 miles, population 500 ; Gustavus, 15 miles, population 500 ; Williamsfield, 20 miles, population 1,000.

This is called the Mecca oil region ; and produces valuable oil in moderate quantities.

WARREN (162 miles). Population 4,000 ; enterprising town ; fine water power, furnished by the Mahoning River, which is much used for motive power in mills, &c., &c. Tributary towns—Gustavus, 6 miles, population 600 ; Bristol, 9 miles, population 500 ; Farmington, 5 miles, population 600 ; Southington, 10 miles, population 500 ; North Jackson, 10 miles, population 800.

Above towns are in Trumbull County, Ohio, population of which is 30,813.

LEAVITTSBURGH (164 miles). Crossing of Cleveland Branch. No station here, but is an important transfer point, both iron and coal passing east and west. Towns on this branch between Leavittsburgh and Cleveland—Braceville, Windham, Garretsville, Mantua, Aurora, Solon.

The above-named towns are the centres of large dairy districts, and large shipments of butter and cheese go from these points to the east and west.

CLEVELAND (214½ miles). Terminus of the Cleveland Branch of the Atlantic and Great Western Railway. Population about 70,000. It is a well laid out town, and large manufacturing interests are represented here, encouraged by the unequalled railway facilities for transportation. The following roads centre at this point :—Cleveland and Toledo Lake Shore Line ; Cleveland, Columbus, and Cincinnati, and the Atlantic and Great Western Railways, and the Cleveland and Pittsburgh Railway. Large quantities of iron ore pass through on its way to Youngstown for smelting, thereby affording a lucrative business to the Atlantic and Great Western Railway Company.

YOUNGSTOWN is an increasing town of 4,000 inhabitants, at the southern end of the Mahoning Branch, and in the centre of the coal fields of Ohio. Here are large iron works, supplied, *viâ* the Cleveland Branch, with ore from Lake Superior.

The district is very rich in coal, and the traffic derived from it, from Sharon to Cleveland and elsewhere, cannot but prove a lasting source of revenue to the company.

For some weeks, however, in consequence of a strike amongst the coal miners, the traffic has suffered much. The miners belong to a trades' union, and are holding out for higher wages, but being now badly off for money, are expected to resume work in two or three weeks.

Towns tributary to Youngstown are—Sharon, Pa., which has also an outlet by railroad and canal to Erie ; New Castle, Lowell, and Mahoning town, are all iron manufacturing towns, the business of which is largely developing. Good coal banks underlie nearly all this region, to which Lake Superior ore is transported for smelting.

...RACEVILLE (169 miles). Situated between the main line and ...eveland Branch, population 1,500. Tributary towns—Sellington, 5 ...es, population 500; Farnington, 10 miles, population 1,000; ...esopotamia, 15 miles, population 500; Newton Falls, 3 miles, ...pulation 1,000; Lordstown and Paris, small places; Windsor, 20 ...les, population 800; dairy farms supply chief traffic.

...FREEDOM (179 miles). Small town, but country in the vicinity is ...sely populated; principal articles of freight are butter and cheese, ...e New York, Cincinnati, and St. Louis.

...WINDHAM (173 miles). Population 1,000. Tributary towns—Paines-...lle, 5 miles, population 800; Palmyra 10 miles, population 500. ...eights, butter and cheese; all the region from Akron, eastward to ...angeville, is a fine grazing country; although small towns, some of ...em furnish as much as 1,000 tons of cheese and butter per annum; ...is desirable freight, higher prices being paid for its transportation ...an for any other article.

...RAVENNA (185 miles). Population 4,000 in Portage County; popula-...on of County 24,407; crossing of Cleveland and Pittsburg Railroad. ...owns tributary—Rootstown, 4½ miles; Randolph, 12 miles, population ...0; Campbellsford, 4 miles, population 600; Streatsburg, 5 miles; ...alersville and Nelson, small towns. The Cleveland and Pittsburgh ...ad is a good connection for the central portion of Atlantic and Great ...estern Railway.

...KENT (192 miles). Lately called Franklin Mills, is a midway station ...n the line, being 196 miles from Dayton, and in consequence of its ...uation, an important position for the workshops, &c., of the Com-...any. The premises are built of white sandstone found on the spot, ...ey are substantial and handsome; they consist of two large car sheds, ...e of which is now used as a machine shop, a 60-horse engine working ...me valuable machinery. The smith's shop and engine shed, with ...om for eighteen engines, is in a forward state, the latter, when com-...leted, being designed for twice that number. The foundations are laid ...r a fine machine shop, and a large drying house and paint shop: these, ...gether with a tank for water on the hill adjoining the works, will com-...lete a very perfect system, which cannot but prove of great service to ...e Company.

...TALLMADGE (197 miles), small town, population 500; Cuyahoga ...Falls, 2½ miles, population 1,500.

AKRON (202 miles), population 7,000—the most important flour milling point in the State, capacity of mills being 1,500 barrels per day—is situated on the Ohio Canal, and on the Cleveland and Zanesville and Cincinnati Railroad; has the best water power of any town in the State. There are large agricultural implement shops here. Tributary towns—Clapley, 5 miles, population 400; East Liberty, 11 miles, population 500; Union Town, 13 miles, population 800; Manchester, 7 miles, population 500; Middlebury, 2 miles, population 1,000.

NEW PORTAGE (207 miles). On canal from Cleveland to Ports-mouth, from which much business may be secured. The canal traverses the rich and fertile valleys of the Scioto and Muskingum, passing through the cities of Newark, Chillicothe, Circleville, &c. Towns tributary—Richfield, 10 miles, population 2,000; Hinckley, 5 miles, population 1,000; Brunswick, 10 miles, population 1,000; Liverpool, 15 miles, population 3,000; Strongsville, 25 miles, population 2,500; Albion and Yellow Creek, 4 miles, population 600. Large earthenware works at this station.

WADSWORTH (215 miles). Population 500. Sharon, Western Star, and River Styx, to the north; Doylestown and Clinton to the south; being villages with a population of 500 to 800; diverging from Wads-worth is the Silver Creek Branch of the Atlantic and Great Western, a coal road six miles long, being the first coal field reached on the line going east from Dayton mining now 200 tons per diem; two more mines of greater capacity will soon be opened. It is expected to sup-ply the towns on the line south with the coal, which is of the cele-brated Chippewa variety, very valuable for gas purposes, situated in Summit County; population 27,400.

SEVILLE (226 miles). Population 1,200. Tributary towns—Jackson, 1½ miles, population 500; Medina, 9 miles, population 6,000; Chat-ham, 8 miles, population 1,000; Lafayette, 7 miles population 1,200; Litchfield, 13 miles, population 1,500.

BRIDGEPORT (232 miles). Population 800. Lodi, 3 miles, popu-lation 400; Windsor, 6 miles, population 400.

WEST SALEM (238 miles). Population 1,000. Situated in Medina County, population 22,700. Tributary towns—Perrysburg, 2½ miles, population 300; Converse, 3 miles, population 800; Homer, 3 miles, population 700.

POLK (244 miles). Population 400. Tributary towns—Troy 8 miles, population 500; Rousburg, 8 miles, population 600.

ASHLAND (252 miles). Population 3,000. Ashland County, popu-lation 21,693. Product principally wheat. Tributary towns—Hayes-ville, 8 miles, population 1,000; Jeromesville, 8 miles, population 1,000; Orange, 4 miles, population 500; Savannah, 7 miles, popu-lation 500.

WINDSOR (261 miles). Population 300. Tributary towns—Olives-burg and Mifflin, 4 to 6 miles.

MANSFIELD (269 miles). Richland County. Population of town, 5,000; of County, 31,121. The road crosses Fort Wayne road from Chicago and Sandusky and Newark, with both of which friendly relations exist, connect at this station for Pittsburg and Chicago; Fort Wayne and Chicago Company have agreed to share equally the expense of a new carriage station here.

ONTARIO (277 miles). Population 500.

GALION, Ohio (283 miles). Population 2,500. Crossing of Cleve-land, Columbus and Cincinnati Railroad, eastern terminus of Belle-fontaine and Indiana Railroad in Crawford County, population 24,165. From here to Marion (distance 21 miles) run side by side with Bella-fontine and Indiana Railroad.

CALEDONIA (295 miles). Population 600.

MARION (304 miles). Population, 3,000. County population, 15,891.

BERWICK (310 miles). Population 700. From hence to North Lewisburg, about 30 miles, the country is new and thinly settled. The woods contain very valuable timber. From Marion east the country is highly cultivated.

RICHMOND (318 miles). Population 800. Bryant, 4 miles; Carey, 7 miles; Middletown, 6 miles. 500 to 800 each in population.

NEWTON (328 miles). No town on line; small village 1 mile distant; large amounts of lumber (timber) sent from this station to Dayton and Cincinnati.

NORTH LEWISBURG (338 miles). Population 1,000. Bellefontaine, population 3,000; East Liberty, 12 miles, population 2,000; Wood-stock, population 600; Middleburg, 6 miles; East Liberty, 8½ miles; Maysville, 10 miles; Newton, 8 miles; Middletown, 4 miles; Pickers-town, 8 miles; Lanesfield, 10 miles. These towns, from 500 to 2,000 inhabitants. Railroad runs through the centre of the county.

MINGO STATION (343 miles). No village here.

TAYLORTOWN (348 miles). No town; small village north of it of 300 inhabitants.

URBANA (352 miles), population 5,000, in Champaigne County, Ohio; population of county 16,591. To this point from Dayton the line runs alongside of the Sandusky, Dayton, and Cincinnati Railroad, and here intersects the line from Indianopolis, Indiana, to Columbus. A fair business is derived from this road. A large live stock trade from the States of Indiana and Illinois will strike here.

TREMONT (360 miles). A small village; population 300. The road from here to Dayton runs near Mad River. This valley is not excelled for fertility and agricultural resources by any portion of the West.

SPRINGFIELD, CLARK COUNTY (366 miles); population 8,000; a large manufacturing town; milling capacity 130,000 barrels per annum; town is 1¼ miles from road; and is a very enterprising place.

SNYDERS (370 miles). No town here.

ENOU (372 miles); population, 1,000; town one mile from station; population of county 25,445. Road traverses centre of county east and west.

OSBORNE, GREEN COUNTY (378 miles); population 1,200; of county 26,778; town of Fairfield 2 miles, population 1,000; Carlisle 4 miles, population 1,500.

KNEISLEY'S (381 miles). No village, 6½ miles from station; a large mill, capacity 100 barrels flour per diem, and an extensive distillery.

DAYTON, MONTGOMERY COUNTY (387 miles); population of city 22,000, of county 52,213—is a manufacturing town, largest item of production being flour to the extent of 150,000 to 200,000 barrels per annum. The tonnage shipped in 1864, by statements from books of various railroads, to New York, Boston, Philadelphia and Baltimore, was 24,693 tons. It is the northern terminus of the Cincinnati, Hamilton, and Dayton Railroad, 60 miles long; and the Eastern terminus of the Dayton and Western Railroad, 40 miles; eastern ter-minus of the Greenville and Miami Railroad, 42 miles; western ter-minus of the Little Miami Railroad, 70 miles from Columbus (capital of the State). The southern terminus of the Dayton and Michigan Railroad, 140 miles; also of the Sandusky, Dayton, and Cincinnati Railroad, 154 miles. Not much trade will be drawn from the north for the Atlantic and Great Western Railway, but a large amount will come from the south and west. A large manufacturing and mercantile jobbing business is carried on here with surrounding country. The road traverses the centre of the county, and connects by the Cincinnati, Hamilton, and Dayton Railroad with Cincinnati, the largest commercial and manufacturing city of the West, having a population of some 200,000.

In the above report, the population has been chiefly taken from the census report of 1860, since which time it has considerably increased.

GOLD MINING IN BRAZIL.—It was mentioned a short time since that a company, with a capital of 75,000*l.*, and an influential direction, was in course of formation for the purchase and working of gold mines in Brazil, a provisional contract having been entered into for the acquisition of the celebrated Taquaril Mine upon advantageous terms. The estate of Ta-quaril adjoins that of Morro Velho, in which at a distance of about six miles from the Taquaril Mine is the justly-celebrated St. John del Rey. Upon a former working the Taquaril Mine was proved to be unusually productive, both as regards the quantity and quality of its mineral, which fact is fully substantiated by the reports of some of the best mining authori-ties in Brazil, among whom are several who were employed in the Taquaril Mine when operations were suspended, owing to the machinery not being equal to the further development of the property. An allusion having been made in one of the reports to the question of the supply of water, the opinion of Capt. R. S. Bryant (of the Santa Barbara Mine) was at once obtained, and upon the point Capt. Bryant remarks that "there are two principal streams or sources, and three small streams. At the rainy season there is an abundant supply from each stream, either of which is more than would ever be required at Taquaril, and judging from the height of the mountain above the level of the watercourse, and from information re-ceived on the spot, I have no hesitation in stating as my opinion that a sufficient supply of water may be obtained from these sources during dry seasons for working any machinery that may be required at Taquaril, es-pecially as there is a fall of hundreds of feet below the watercourse directly under the mine." It may be mentioned that the Taquaril estate is free-hold, and that the lodes run through it a distance of about six miles. It is well timbered, and possesses every facility for economically carrying on extensive mining operations. Several mining authorities have estimated that 10,000*l.* will be ample to place the mine in an efficient working con-dition, and to make handsome returns.

COLLIERIES IN AMERICA.—One of the most extensive coal mines in the United States is that of Col. Taylor, in Illinois. It is 250 ft. deep, and is worked by a single perpendicular shaft. From 250 to 350 tons per day are taken out. It is under the immediate charge of an old Pennsylvanian, Miles McHugh, who will be remembered by the coal men of the Broad Top, Osceola, and Dalilizin districts. The value of the coal at the mines is fixed at twice the price paid for mining. Much coal, however, was sold last winter at Chicago at $12 per ton. One of the most remarkable circumstances connected with the mines of this vicinity is the fact that no water is found in the rocks in which the coal occurs. There is a stratum 60 ft. below the surface, from which a small pump draws the product of a single spring, but none of the rocks containing the three seams have any water running through them, and no pumps descend lower than 60 ft. I have been to the bottom of more than a hundred metal and coal mines in this and the Old World, and this stands an isolated instance among them all of a shaft as deep as 250 ft., requiring no means of drainage. Nothing but the impervious character of the strata can make this exemption possible, since many of the workings are beneath the bed of the Illinois river and canal, and from 40 to 50 in. of rain fall here annually: 130,000 tons of coal were extracted from this field in 1863.

MAGNETIC ADHESION ON RAILWAYS.—A proposition was some time since made to increase the adhesion of the wheels of locomotives by mag-netising them, and experiments which have since been made enable some conclusions to be formed as to the value of the proposition. It is stated that the gain of adhesion, by the application of electric helices to the driving wheels of locomotives, has been proved to average, on a series of trials and varied conditions, as much as 40 per cent. A locomotive with the electro-magnetic ad-hesion applied, as demonstrated by 13 months' comparative workings on the New Jersey Central Railroad of America, will draw such an amount of extra load as, at a half-penny per ton per mile, will realise on a day's work an extra surplus profit of 6*l.* sterling; this, counting 250 days to the year, will be an annual extra revenue of 1500*l.* per annum for each locomotive. Now, that 1500*l.* per annum additional profit upon each locomotive used by a large company would produce a marked increase in the amount available for dividend cannot be doubted, but particular care must be taken that in calculating this extra profit no charge is placed to capital account, which properly belongs to profit and loss. In the latest arrangement a transverse helix was applied to a wheel carved in the direction of the periphery, upon a radius equal to the diameter of the wheel itself, and it was found that magnetism was instantly induced in the tyre. Upon the helix being connected with a suitable battery, at a trial made on the Fitchburg Railroad, the increase of adhesion was found to be upwards of 40 per cent. when one pair of the two pairs of driving wheels of the locomotive was magnetised. The test was made in se-veral ways. First, by chaining the engine to a post on a greased track, with grease on the wheels, when it was found that without magnetism but 19 lbs. of steam to the inch was required to slip the drivers; with magnetism, and the same conditions, 35 lbs. of steam to the inch were necessary to slip the wheels. On a clean smooth track, in bright sunshine, with all the conditions most favourable for the traction of the engine, 50 lbs. to the inch slipped the wheels without magnetism, the engine being chained up as be-fore; with the magnetism, 88 lbs. of steam to the inch were let on before the wheels began to turn. A number of separate experiments resulted in the average given. The whole apparatus to obtain these results is simple, and consists of a helix or coiled wire and battery. The battery is so arranged that the acids do not slop over in consequence of the jarring motion of the engine. Any engine now in use, or any to be built, may have the apparatus attached to it with but very little labour, and with merely the ad-dition of the helices and battery, and a light engine may be made to do the work of a heavy one. The sole question is, whether the cost of maintaining the electricity, and keeping the battery and apparatus in order, is less than the amount of the increased economy effected, and upon this point it is desirable that details should be published.

NITRIC ACID.—M. Dietzenbacher addressed to the Academy of Sciences a paper, in which we find a few new facts concerning nitric acid. It is well known that boiling nitric acid is a powerful oxidising agent, and that it is constantly used in laboratories for that purpose; but even at the ordinary temperature fuming nitric acid will produce similar effects, which acquire a high degree of intensity when monohydrated nitric acid is mixed with Nordhausen sulphuric acid—that is with anhydrous sulphuric acid, which has attracted moisture, and is distinguished from common oil of vitriol by its dark colour and the fumes it emits. Boiling nitric acid is known to transform sulphur into sulphuric acid; fuming nitric acid will do the same when brought into contact with flowers of sulphur at the common temperature; yellowish red vapours are seen to rise, the mixture be-comes hot, and the liquid obtained will cloud chloride of barium, a sure sign of the pre-sence of sulphuric acid. Sulphur in sticks is oxidised in the same way, but less vio-lently. Much depends on the degree of consentration of the nitric acid, and if a few drops of Nordhausen sulphuric acid be added, the reaction is very strong. Fuming nitric acid will dissolve phosphorus at the common temperature; phosphorus burns in contact with a mixture of equal parts of fuming nitric and sulphuric acids; the experiment is not without danger. Fuming nitric acid attacks red phosphorus but slightly; after some time the liquid resulting from the operation will precipitate the acid nitrate of bismuth. In the mixture of monohydrated nitric acid and fuming sulphuric acid, a portion of red phosphorus is transformed into phosphoric acid and catches fire, the re-action being accompanied by a copious emission of the usual yellowish-red vapours of deutoxide of nitrogen. The mixture of fuming nitric acid and Nordhausen acid is one of the most powerful agents for oxidation known; for the latter not only attracts all the water of the nitric acid, but also determines a real decomposition of it when the temperature increases. If a mixture of concentrated nitric acid and the Nord-hausen one be heated in a glass retort to boiling point, an abundant evolution of pure oxygen is obtained. The mixture of the two acids will in a few minutes change arsenic into arsenious acid; at the common temperature, fuming nitric acid alone does not ex-ercise any sensible action on arsenic. In the same mixture, charcoal and lamp black will burn very briskly. A mixture of fuming nitric acid and phosphoric acid will pro-duce the same effect. The mixture of these two acids exercises no action on easily oxi-disable metals. Zinc, which is violently attacked by concentrated nitric acid, experiences no alteration in the mixture of that and the Nordhausen acid; it may lie in it for days, and even at boiling point, without any sympton of reaction. But this mixture will im-mediately transform cotton into gun-cotton, which will catch fire without leaving residue.

STATISTICS OF MAGNESIUM.—The light emitted by a wire one-thou-sandth of an inch in diameter, is equal to that of seventy-four sterine candles of five to the pround: 3 ft. of it are burned per minute, or ¼ oz. per hour, the cost of which, at the present price, would be about 2*s.* 6*d.* Seventy-four stearine candles would, however, in the same time, consume 2 lb. of stearine, which would cost 2*s.*: 40·4 cubic feet of 12-candle coal gas would be required to produce the same effect, and would cost about 2¾*d.* The dearness of magnesium arises from the dearness of sodium required in obtaining it. Sodium is now 10*s.* per lb., and one pound, under the most favourable circumstances, would be required for a pound of magnesium. But increased demand will, no doubt, cheapen sodium, and in other ways also render the production of magnesium more economical. Already the Magnesium Metal Company have reduced the price of magnesium more than 50 per cent. Magnesium gives off 265 times less heat than gas. Gas and candles vitiate the air by the production of watery vapour and carbonic acid; magnesium is free from this objection, but it has an incon-venience of its own—a large quantity of calcined magnesia is thrown off as a fine powder, which soon renders the atmosphere of a room intolerable. This is also objectionable in photography, though used only for very short periods. For ordinary purposes it would render some peculiar mode of ventilation or purification, yet to be discovered, indispens-able. Perhaps the smoke might be conducted through water and thus condensed. At best magnesium can be only an imperfect substitute for sunlight: its light has been found to be only the 1-525th of that of the sun on a bright November day; but, at the same time, its chemical effect was ascertained to be the 1-36 of that of the sun.

IMPROVEMENTS IN RAISING WATER FROM MINES.

An improved water-raising apparatus, intended for mines, and having the advantage of rendering the use of pump-rods unnecessary, has been patented by Mr. F. S. Pease, of Buffalo, U.S., which is considered to pro-mise unusual results. The action of the present apparatus is described as analogous to that of the low pressure or condensing engine. A stream of compressed air is forced into the well by suitable means; the air acting upon the surface of the oil in the bottom of the well-tube, forces it up the tube into a chamber, where it is sustained or prevented from returning. This compressed air is then exhausted, leaving a comparative vacuum, which causes the water to rush up to fill the vacuum. The alternate action of the pressure and exhaust causes a vibration or pulsation in the well-tube, which results in filling the chamber at every pulsation, causing an enormous and rapid delivery.

The invention has already been applied to the raising of petroleum, and it is stated that the oil rises into a chamber of any given length, and is instantly elevated that length, whatever it may be. If an ordinary lifting-pump has a stroke of 30 in., the oil is raised that distance each stroke, but with this devise, if the oil chamber is 30 ft. in length the fluid is raised so far each stroke, and at one-half of a revolution of the valve. From this statement, it is easy to see that the quantity raised by this system is far greater than is produced by half-a-dozen pumps. As the inventor says, it will take a good flowing well to supply it. One apparatus can be made to work a number of wells, it only requiring the arrangement in the well-tube, and connecting the air-pipe with the valve; any one well can work independently of the others, or all work together from one and the same power, of which there is always a surplus for contingencies. The lowest estimate of its capacities, made by scientific and practical men who have examined it, is that it is equal to over 2200 barrels per day from a 2-in. pipe, and 4090 barrels per day from a 2¼-in. chamber, and over 8200 barrels per day from a 3-in. pipe—the amount varying with the size of the pipe-tube, chamber, and displacement pipe. The mechanical parts of the system are few in number, and not complicated.

The apparatus consists of two air-pumps, which exhaust air from two receivers. The pumps are driven by a pulley and belt. The rotary valve can be worked by a pulley on the shaft, or worked independent of the pumps. This valve is of peculiar construc-tion, and is covered by a separate patent. It opens and closes communication alternately with the well and the atmosphere and receivers. The pipe on which this valve is placed leads into both vessels. By the action of the valve, then, a charge of compressed air is forced down upon the surface of the oil in the pipe or pump-chamber, the result being that the oil in the chamber is forced upwards into the next chamber above; by the continued actions of the rotating valve the compressed air is exhausted immediately, so that the oil from below comes rushing up through the valve to supply the vacuum, and thus raises the oil forced by the percussive action of the compressed air to surface. Of course, the return of the liquid is also prevented by the same valves. Where there is a sufficient amount or height of oil or water in the well, only one receiver would be in use until the water was exhausted sufficiently to require the other; in such a case the pressure is relieved, by the valve only, to a sufficient amount to allow the chamber or vacuum to fill, the presure is counterbalanced, and the column of air vibrates. It is considered that for mines a chamber of 20 or 30 feet, in a state of vacuum 30 or more times per minute, would be more than ample for all practical purpose.

THE MINERAL RESOURCES OF ITALY.

That the mineral resources of Italy are capable of profitable develop-ment has long been acknowledged, and within the past few years English enterprise has been directed to the working of mines producing various metals, and situated in almost every part of the country. In addition to those at present known to the English public from the large amount of English capital embarked in them, it appears that the Italians themselves are thoroughly alive to the advantages to be derived from energetic mining operations, since efforts are being made to induce English capitalists to embark in speculations of this class carried on by Italian adventurers and Italian miners. Amongst the mines now being worked upon this principle there are many which, to judge from the state-ments made concerning them, possess indications fully equal to any that have been secured by English companies.

The silver-lead mine of Crandola is situated in the most eligible part of the Valsas-sina, a delightful valley, communicating with Lecco and the Lake of Como by means of a good carriage-road. The net-work of Lombardian railways, which has one of its heads at Lecco, communicates with the sea port of Genoa. The charge for conveying 1 ton of mineral thence does not exceed 1*ls.* 4*d.* per ton. From repeated assays made at Turin, by the Professor of Chemistry to the Government Mining Council, the ore has been found to contain, when reduced in schlich, 69 per cent. of lead, and 56 English ounces of silver per ton. The works already done upon this property, which embraces the best part of a mountain, and appears inexhaustible from the character of its lodes, consist of three galleries, of the aggregate length of 109 yards, on vein No. 1; and four others, driven one above the other at an interval of 20 yards, on vein No. 2. There are besides, two shafts, of the aggregate depth of 72 yards, which have been sunk between two of the above-mentioned galleries, and right into the ore. On prosecuting the work of the adit level on vein No. 1 there was discovered an old gallery, containing plenty of ore, and in the vicinity of the mine there is always abundance of water, though the mine itself requires no draining, and is likewise in such rock that there will be no necessity for timbering, which cannot but be regarded as favourable.

In the same province—that of Como—as that in which the Crandola Mine is situated, and likewise in the same valley, other silver-lead mines occur, upon which explorations have been begun on a scale sufficient to test their respective condition. At Dervio, Cortabbio, and Vimogno, in the Valsassina, very promising copper mines are in course of working, likewise in the province of Bergamo, which is confining with that of Como, two other copper mines, situated the one in the parish of Valtora, and the other in that of Fondra, have already produced most excellent copper pyrites, though hitherto super-ficially explored. In the province of Brescia, at Malonna, another rich copper mine is in course of working. The ores of the above mines, assayed by the best assayists of the Italian, French, and German mining schools, have returned from 10 to 27 per cent. of fine copper. In the province of Turin, beyond the very pretty and interesting town of Ivrea, are several mines well worthy of attention. At Valprato, an extensive mine of auriferous copper ore, yields, per ton of 1000 kilogrammes (the English ton being equal to 1015 kilogrammes), 147 kilogrammes of fine copper and 20 grammes (303 troy grains) of gold. The mine consists of three powerful strata, placed one above another at an in-clination of about 29°. The quantity of ore in sight is enormous. The mine can be worked like a quarry for a very long period of time, and offers invaluable advantages; in fact, it may be fairly said that there is hardly in any country a mine so abundant in valuable mineral, and wherefrom so plentiful a source of income can be realised; but the mine being distant from the borough of Pont by a journey of six hours on horseback, along a rather neglected road, the parties working this mine will have to calculate upon the necessity of making a good carriage-road, to be completed in (say) 5 years, thereby laying out some small capital, which will, however, be promptly recovered from the proceeds of this remarkable copper and gold mine.

At Tavagnasco there is a copper mine, the ore of which has been proved to contain for every ton of 1000 kilogrammes 175 kilogrammes (386 lbs. English) of metallic cop-per. There are five galleries practised on the various lodes, and other important work-ings, in which the ore of copper is abundantly found. Every probability exists that this mine will turn out an excellent one. Issiglio is a neat little village, above which a mine, containing the ores of copper and nickel in encouraging proportions, is in a state of regular exploration. The ore becomes more compact and richer in nickel as the work progresses, so that in a short time this sett may prove very valuable. Other mining setts, where copper, lead, and nickel have been found to exist in interesting proportions, have been secured by purchase or otherwise in the same district, and will be gradually put in working condition. In the province of Novara, and in the region of the Ossola, where the mines already known to the British public, Vallanzasca and Val Toppa, are situated, is a mine called Antronapiana, which produces abundantly an ore of copper and nickel, containing 8½·4 per cent. of the former metal, and 4¾·4 per cent. of the latter. The length of the winter of 1864 has prevented this mine being extensively explored; but during the course of the good season in 1865 nothing will be spared to bring it to a thorough state of investigation, and test its worth, which seems highly promising.

In addition to the richer ores, there is in Italy an almost inexhaustible supply of cop-per ore of small percentage—2½ to 4 per cent.—which cannot be smelted with the high price of fuel in that country; attention has, therefore, been turned to the chemical treatment of these minerals, the result of which has been that the most complete suc-cess has crowned the endeavours of the companies who have tried it, and, at a very con-siderable profit, the copper is extracted by this method from poor ores, hitherto con-sidered as useless.

The Mezzenile Copper, Nickel, and Cobalt Mine, in the province of Turin, is worthy of particular notice. The various veins constituting this mine can be traced out for a very long distance within the precincts of the grant, which embraces a surface of ground equal to 985 English acres. The disposition of the mountain where the mine is situated, and which presents a steep declivity, allows the rough ore to be brought cheaply to the carriage-road. In short, this mine is one of the most remarkable of the kind existing in Europe, and presents to the naked eye such masses of rich ore as to leave no doubt whatever of the profitable results of a mining speculation conducted at Mezzenile, with a sufficient capital to work the sett as it ought to be—water-power, cheap manual labour, transit by road and rail to the sea, and every requisite being at hand.

PRICES OF MATERIALS,

As charged at GREAT WHEAL VOR UNITED MINES during the following months:—

		Jan.	Feb.	March.
Coals, common	per ton	12s. 6d.	12s. 6d.	12s. 6d.
,, Cardiff	,,	18 4	18 4	18 4
Iron, common	per cwt.	—	9 6	9 6
,, best	,,	11 6	11 6	11 6
Steel, cast and blister	,,	—	45s.–50s.	45 0
Nails, patent 5 and 6 inch	,,	20 0	20 0	20 0
Tallow	,,	45 6	45 6	45 6
Grease	,,	—	—	26 0
Candles	per dozen	5 5	5 5	5s.5d.–5s.3d.
Hilts, pick	,,	2 0	—	—
Powder	per 100 lbs.	40 0	40 0	40 0
Cartridges	per 100	38s.–52s.	38s.–52s.	38s.–52s.
Leather, bend	per lb.	2 4	2 4	2 4
,, butt	,,	2 0	—	2 0
White yarn	,,	0 5½	0 5½	0 5½
Hemp	,,	0 5	—	0 5
Timber, Norway	per foot	0 8½	0 8½	8½d.–8d
,, pine	,,	1 4	1 2½	1 2½
,, selected pine	,,	3 3	3 3	—
,, oak	,,	3 0	—	—
,, battens	,,	0 1½	0 1½	0 2
Rope	per cwt.	42 0	42 0	42 0
Stamp-heads, longshanks	,,	9 0	9 0	9 0
Chain	,,	—	—	29 6

BORING APPARATUS.—Mr. Pelham Maitland, of River-street, Myddel-ton-square, proposes to work the bucket in a hollow rod, formed of lengths of tube joined together; when the bucket is full the fact may be made known by the explosion of a percussion-cap at the surface, by releasing a hammer to fall upon it.

International Exhibition, 1862—Prize Medal.

JAMES RUSSELL AND SONS (the original patentees and first makers of wrought-iron tubes), of the CROWN PATENT TUBE WORKS, WEDNESBURY, STAFFORDSHIRE, have been AWARDED a PRIZE MEDAL for the "good work" displayed in their wrought-iron tubes and fittings.
Warehouse, 81, Upper Ground-street, London, S.

BICKFORD'S PATENT SAFETY-FUSE OBTAINED the PRIZE MEDALS at the ROYAL EXHIBITION of 1851, at the INTERNATIONAL EXHIBITION of 1862, in London, and at the IMPERIAL EXPOSITION held in Paris, in 1855.

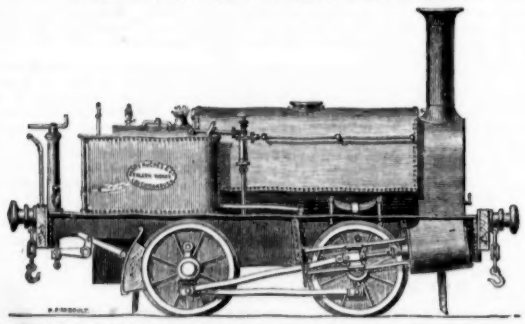
BICKFORD, SMITH, AND CO., TUCKINGMILL, CORNWALL, MANUFACTURERS, of PATENT SAFETY-FUSE, having been informed that the name of their firm has been attached to fuse not of their manufacture, beg to call the attention of the trade and public to the following announcement:—
EVERY COIL of FUSE MANUFACTURED by them has TWO SEPARATE THREADS PASSING THROUGH the COLUMN of GUNPOWDER, and BICKFORD, SMITH, AND CO. CLAIM SUCH TWO SEPARATE THREADS as THEIR TRADE MARK.

Prize Medals—International Exhibition, Class 1 and 2.

PATENT PLUMBAGO CRUCIBLES.—The CRUCIBLES manufactured by the PATENT PLUMBAGO CRUCIBLE COMPANY are the ONLY KIND for which a MEDAL has been AWARDED, and are now used exclusively by the English, Australian, and Indian Mints; the French, Russian, and other Continental Mints; the Royal Arsenals of Woolwich, Brest, and Toulon, &c.; and have been adopted by most of the large ENGINEERS, BRASSFOUNDERS, and REFINERS in this country and abroad. The GREAT SUPERIORITY of these melting pots consists in their capability of melting on an average 40 pourings of the most difficult metals, and a still greater number of those of an ordinary character, some of them having actually reached the EXTRAORDINARY NUMBER of 96 meltings. They are unaffected by change of temperature, never crack, and become heated much more rapidly than any other crucibles. In consequence of their great durability, the saving of waste is also very considerable.

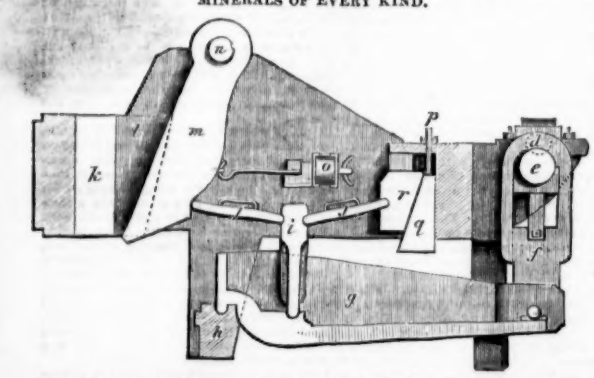
The company have recently introduced CRUCIBLES SPECIALLY ADAPTED for the following purposes, viz.:—MALLEABLE IRON MELTING, the average working of which has proved to be about seven days; STEEL MELTING, which are found to save nearly 1¼ ton of fuel to every ton of steel fused; and for ZINC MELTING, lasting much longer than the ordinary iron pots, and saving the great loss which arises from mixture with iron.
The Patent Plumbago Crucible Company likewise manufacture and import Clay Crucibles, Muffles, Portable Furnaces, &c., Stove Backs, all descriptions of fire-standing goods, and every requisite for the Assayer and Dentist.
For lists, testimonials, &c., apply to the Patent Plumbago Crucible Company, Battersea Works, London, S.W.

HENRY HUGHES AND CO.,
FALCON RAILWAY PLANT WORKS,
LOUGHBOROUGH,
ENGINEERS, IRONFOUNDERS, BOILER MAKERS, and MANUFACTURERS of EVERY DESCRIPTION of RAILWAY MACHINERY.



LOCOMOTIVE ENGINES, for MINERAL and CONTRACTORS' RAILWAYS, of the best materials and workmanship, always in progress. These engines are designed to supply the chief requisites in tank locomotives—viz., reduction of the overhanging weight at the fire-box end, proper distribution of the weight upon the wheels, and keeping the centre of gravity low. These are accomplished by making the fire-box and its shell on an improved principle, which enables the driving axle to be placed further back without interfering with the eccentrics and valve gear, which are of the usual simple description.

BLAKE'S PATENT STONE BREAKER
OR ORE CRUSHING MACHINE,
FOR REDUCING TO SMALL FRAGMENTS ROCKS ORES, AND MINERALS OF EVERY KIND.

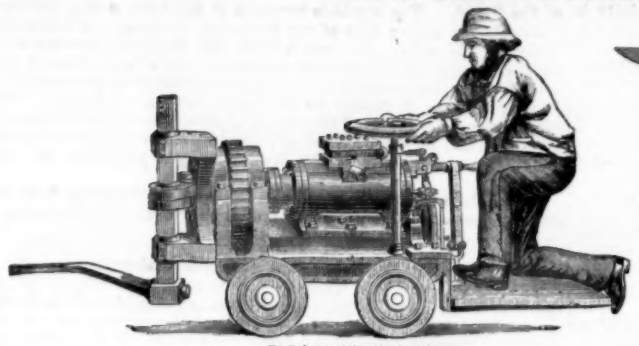


It is rapidly making its way to all parts of the globe, being now in profitable use in California, Washoe, Lake Superior, Australia, Cuba, Chili, Brazil, and throughout the United States and England.
The above section illustrates Blake's Stone Breaker, just as made the last five years and is fully protected in every part by patents.
Extract from Specification:—A short but powerful vibration is imparted to one or both of the jaws by any convenient arrangement, and combination of powerful levers, worked by a crank or eccentric on the main shaft.
LEGAL PROCEEDINGS will be taken at once against any person or persons found making, using, or vending any machine, the construction of which will constitute an infringement on the above patent. Read extracts of testimonials:—
Alkali Works, near Wednesbury.—I at first thought the outlay too much for so simple an article, but now think it money well spent. WILLIAM HUNT.
Welsh Gold Mining Company, Dolgelly.—The stone breaker does its work admirably crushing the hardest stones and quartz. WM. DANIEL.
Our 15 by 7 in. machine has broken 4 tons of hard winstone in 20 minutes, for fine road metal, free from dust. MESSRS. ORD and MADDISON,
Stone and Lime Merchants, Darlington.
Kirkless Hall, near Wigan.—Each of my machines breaks from 100 to 120 tons of limestone or ore per day (10 hours), at a saving of 4d. per ton. JOHN LANCESTER.
Oocca, Ireland.—My crusher does its work most satisfactorily. It will break 10 tons of the hardest copper ore stone per hour. WM. G. ROBERTS
General Frémont's Mines, California.—The 15 by 7 in. machine effects a saving o the labour of about 30 men, or $75 per day. The high estimation in which we hold your invention is shown by the fact that Mr. Park has just ordered a third machine for this estate. SILAS WILLIAMS
For circulars and testimonials, apply to—
H. R. MARSDEN, SOHO FOUNDRY,
MEADOW LANE, LEEDS.
Only maker in the United Kingdom.

SALOM'S NEW OPERA and FIELD GLASS, and the RECONNOITERER GLASS, price 10s. 10d., sent free.—This tourist's favourite, through extraordinary division of labour, distinctly shows small windows 10 miles off, landscape at 30 miles, Jupiter's moons, &c.—The MARQUIS OF CARMARTHEN: "The reconnoiterer is very good."—The EARL of BREADALBANE: "I find it all you say; and wonderfully powerful for so very small a glass."—Rev. LORD SCARSDALE "approves of it."—LORD GIFFORD, of Ampney: "Most useful."—LORD GARVAGH: "Remarkably good."—SIR DIGBY CAYLEY, of Brompton: "It gives me complete satisfaction, and is wonderfully good."—SIR W. H. FEILDEN: "I do not think it can be surpassed: it gives great satisfaction."—CAPTAIN SENDEY, Royal Small Arms Factory, Enfield, "found it effective at the 1000 yards range."—F. H. FAWKES, of Farnley Hall, Esq.: "I never before, although I have tried many, met a glass combining so much power for its size with so much clearness."—*The Field:* "We have carefully tried it at an 800-yard rifle range, and found it fully equal to any of those present, although they had cost more than four times its price.—*Notes and Queries:* "What intending tourist will now start without such an indispensable companion?" The celebrated HYTHE GLASS shows bullet-marks at 1200 yards, and men at 3½ miles; price, 31s. 6d. All the above glasses, respectively bearing the registered trade marks, "Salom," "Reconnoiterer," and "Hythe," are only to be had direct from SALOM and Co., 98, Princes-street, Edinburgh. A few hours will carry a glass to almost the remotest town in the United Kingdom.
No agents of any kind anywhere.

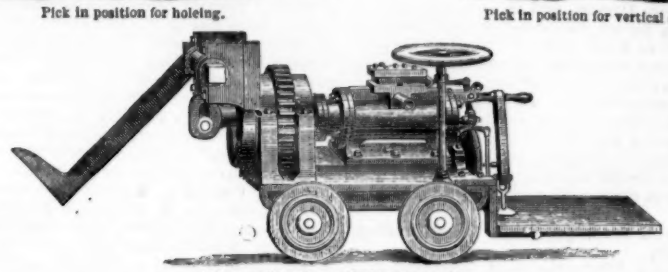
COAL CUTTING MACHINERY.

JAMES GRAFTON JONES'S PATENT.



Pick in position for holeing.

Pick in position for vertical cut downwards.



Pick in position for vertical cut upwards.

Messrs. JONES and LEVICK, proprietors of this patent, are prepared to supply these Machines, which are on an improved principle, and are constructed to work the coal at any angle from the horizontal to the vertical, thus rendering them capable of "holeing" at any angle, and of driving "headings." They are simple and substantial in construction, and are not likely to get out of order. They are already successfully employed in the Barnsley coal district, and are being introduced into the South Wales and other coal mining districts. They are also suitable for mining the argillaceous ironstones of the coal measures, as well as working other mines and quarries.

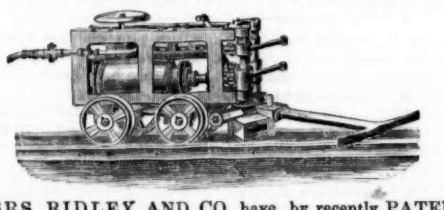
N.B.—Air Compressing Machinery will be supplied, or plans and specifications furnished.

Applications to be made to Messrs. FREDERICK LEVICK and Co., 4, Charlotte-row, Mansion House, London; or Messrs. LEVICK and SIMPSON, Blaina Ironworks, near Newport, Monmouthshire.

COAL CUTTING MACHINERY.—The WEST ARDSLEY COMPANY having, by recently patented improvements, perfected their coal cutting machinery, worked by compressed air, are NOW READY to MAKE CONTRACTS for the CONSTRUCTION and USE of their MACHINES.
The results of twelve months' experience in the working of these machines, by the West Ardsley Company, have proved most satisfactory, their use being found to CHEAPEN the COST and IMPROVE the average SIZE of the COAL, to LIGHTEN the LABOUR, and also to MODIFY the SANITARY CONDITION of the MINE.
All communications to be made to Messrs. FIRTH, DONISTHORPE, and BOWER, No. 8, Britannia-street, Leeds.

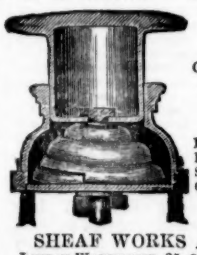
NOTICE.—The WEST ARDSLEY COMPANY, having reason to believe that their patents are being infringed upon, hereby give notice that they will TAKE LEGAL PROCEEDINGS AGAINST ALL PARTIES who may MAKE FOR SALE, or USE ANY MACHINERY in the construction of which any such INFRINGEMENT is MADE.

COAL CUTTING BY MACHINERY.



MESSRS. RIDLEY AND CO. have, by recently PATENTED IMPROVEMENTS, COMPLETED their TRUNK COAL CUTTING MACHINE, WORKED by COMPRESSED AIR, and are NOW PREPARED to NEGOCIATE for the USE, and to SUPPLY MACHINES, which will be found to COMBINE SIMPLICITY of CONSTRUCTION with PORTABILITY and ECONOMY in WORKING. By the use of these machines a CONSIDERABLE SAVING of COAL is EFFECTED, and the COST of LABOUR MUCH REDUCED. Each machine will be guaranteed as to its capabilities, &c.
All applications to be made to Messrs. RIDLEY and Co., No. 11, South-street, Finsbury, London, E.C.; or Mr. PERCY BANKART, agent, 9, Clement's-lane, E.C.
*** COLLIERY PROPRIETORS are CAUTIONED against PURCHASING or USING MACHINES, the construction of which will constitute an INFRINGEMENT of the ABOVE PATENT.

THOMAS TURTON AND SONS,
MANUFACTURERS OF
CAST STEEL for PUNCHES, TAPS, and DIES, TURNING TOOLS, CHISELS, &c.
CAST STEEL PISTON RODS, CRANK PINS, CONNECTING RODS, STRAIGHT and CRANK AXLES, SHAFTS and FORGINGS of EVERY DESCRIPTION.



DOUBLE SHEAR STEEL,	FILES MARKED
BLISTER STEEL,	T. TURTON.
SPRING STEEL,	EDGE TOOLS MARKED
GERMAN STEEL,	WM. GREAVES & SO

Locomotive Engine, Railway Carriage and Wagon Springs and Buffers.
SHEAF WORKS AND SPRING WORKS, SHEFFIELD.
LONDON WAREHOUSE, 35, QUEEN STREET, CANNON STREET, CITY, E.C.,
Where the largest stock in the world may be selected from.

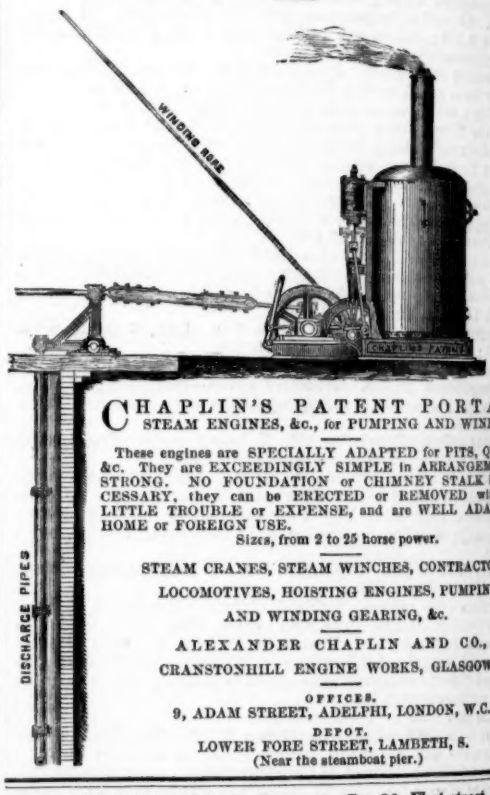
Swan Rope Works.

GARNOCK, BIBBY, AND CO.,
CHAPEL STREET, LIVERPOOL,
MANUFACTURERS of FLAT and ROUND HEMP and IRON and STEEL WIRE ROPES for MINING, RAILWAY, and SHIPPING PURPOSES.
MANILLA ROPE of SUPERIOR QUALITY, FIFTY PER CENT. STRONGER, and THIRTY PER CENT. CHEAPER than Russian hemp rope.
WIRE ROPE of FIRST QUALITY WIRE, and the HIGHEST STANDARD of STRENGTH.

BASTIER'S PATENT CHAIN PUMP,
APPARATUS FOR RAISING WATER ECONOMICALLY, ESPECIALLY APPLICABLE TO ALL KINDS OF MINES, DRAINAGE, WELLS, MARINE, FIRE, &c.

J. U. BASTIER begs to call the attention of proprietors of mines, engineers, architects, farmers, and the public in general, to his new pump, the cheapest and most efficient ever introduced to public notice. The principle of this new pump is simple and effective, and its action is so arranged that accidental breakage is impossible. It occupies less space than any other kind of pump in use, does not interfere with the working of the shafts, and unites lightness with a degree of durability almost imperishable. By means of this hydraulic machine water can be raised economically from wells of any depth; it can be worked either by steam-engine or any other motive power, by quick or slow motion. The following statement presents some of the results obtained by this hydraulic machine as daily demonstrated by use:—
1.—It utilises from 90 to 92 per cent. of the motive power.
2.—Its price and expense of installation is 75 per cent. less than the usual pumps employed for mining purposes.
3.—It occupies a very small space.
4.—It raises water from any depth with the same facility and economy.
5.—It raises with the water, and without the slightest injury to the apparatus, sand mud, wood, stone, and every object of a smaller diameter than its tube.
6.—It is easily removed, and requires no cleaning or attention.
BASTIER'S PATENT CHAIN-PUMP may be seen daily in operation at Messrs. SAMUEL BERGER AND CO.'s Patent Rice Starch Works, Bromley-by-Bow, London, E. Cards of admission to be had on application to the inventor and patentee, Mr. J. U. BASTIER, C.E., 142, Gower-street North, London.
J. U. BASTIER, sole manufacturer, will CONTRACT to ERECT his PATENT PUMP at HIS OWN EXPENSE, and will GUARANTEE IT FOR ONE YEAR, or will GRANT LICENSES to manufacturers, mining proprietors, and others, for the USE of his INVENTION.
OFFICES, 142, GOWER STREET NORTH, LONDON.
London, March 21, 1859. Hours from Ten till Four. J. U. BASTIER, C.E.

Prize Medal—International Exhibition, 1862.



CHAPLIN'S PATENT PORTABLE STEAM ENGINES, &c., for PUMPING AND WINDING.

These engines are SPECIALLY ADAPTED for PITS, QUARRIES, &c. They are EXCEEDINGLY SIMPLE in ARRANGEMENT, and STRONG. NO FOUNDATION or CHIMNEY STALK being NECESSARY, they can be ERECTED or REMOVED with VERY LITTLE TROUBLE or EXPENSE, and are WELL ADAPTED for HOME or FOREIGN USE.
Sizes, from 2 to 25 horse power.

STEAM CRANES, STEAM WINCHES, CONTRACTORS' LOCOMOTIVES, HOISTING ENGINES, PUMPING AND WINDING GEARING, &c.

ALEXANDER CHAPLIN AND CO.,
CRANSTONHILL ENGINE WORKS, GLASGOW.

OFFICES.
9, ADAM STREET, ADELPHI, LONDON, W.C.
DEPOT.
LOWER FORE STREET, LAMBETH, S.
(Near the steamboat pier.)

Works published at the MINING JOURNAL *office, 26, Fleet-street, London.*

PRACTICAL TREATISE ON MINE ENGINEERING. By G. C. GREENWELL. In one vol., half-bound, £2 15s.; whole bound in Morocco, £3 10s. In two vols., half-bound, £3 3s.
TREATISE ON IRON METALLURGY. By S. B. ROGERS. £1 5s.
STATISTICS OF MINING (ANNUAL). By W. H. CUELL. 6d.
"CORNISH NOTES."—NEW SERIES. By J. Y. WATSON, F.G.S. 1s.
RISE AND PROGRESS OF MINING IN DEVONSHIRE. By G. CROWEN. 1s.
SLATE QUARRIES IN WALES. By T. C. SMITH. 1s.
SLATE QUARRIES AS AN INVESTMENT. By J. BOWER. 1s.
NEW GUIDE TO THE IRON TRADE, OR MILL MANAGERS' AND STOCK-TAKERS' ASSISTANT. By JAMES ROSE. 8s. 6d.
STOCKTAKERS' ASSISTANT AND OFFICE COMPANION. By J. PARR. 7s. 6d.
MINING AND SMELTING MAGAZINE. Monthly. 1s. 6d.
VENTILATION OF MINES, FOR THE USE OF UNDERGROUND MANAGERS AND OVERMEN. By RALPH MOORE. 5s.
SECTION OF LANARKSHIRE COAL MEASURES (NEW EDITION). By RALPH MOORE. 10s. 6d.
MINERS' MANUAL OF ARITHMETIC AND SURVEYING. By WM. RICHARDS. 10s. 6d.; by post, 11s.
TRANSACTIONS OF THE NORTH OF ENGLAND INSTITUTE OF MINING ENGINEERS. Eleven volumes: 21s. per volume. [Single copies can be had.]
TABLES FOR ASCERTAINING THE VALUE OF TINSTUFF. By Capt. CHARLES THOMAS. 5s.
TAPPING'S HIGH PEAK MINING CUSTOMS. 5s.
TAPPING'S HANDYBOOK ON MERCANTILE, MINING, AND OTHER JOINT STOCK COMPANIES. 2s. 6d.
THE COST-BOOK—TAPPING'S PRIZE ESSAY—WITH NOTES AND APPENDIX. 4s.
TAPPING'S DERBYSHIRE MINING CUSTOMS. 6s.
BOOK-KEEPING BY DOUBLE ENTRY, EXPRESSLY ADAPTED FOR THE IRON TRADE. By G. J. WILLIAMS. Cloth, 10s. 6d.
MINING JOURNEY ACROSS THE GREAT ANDES. By Major RICHARD. 7s. 6d.
TAPPING'S COLLIERY AND ORE MINE INSPECTION AND TRUCK ACTS. Cloth, 6s.
TAPPING'S EDITION OF MANLOVE'S CUSTOMS OF THE LEAD MINES OF DERBYSHIRE. 3s.
COST-BOOK SYSTEM—ITS PRINCIPLES AND PRACTICE. 6d.
MINES AND MINING COMPANIES (A Practical Treatise on the Relating to). By WHITTON ARUNDELL. 4s.
MINERS' TABLES. By W. WHITBURN. 4s.
ON COPPER SMELTING. By HYDE CLARKE, C.E. 1s.
MANUAL FOR EXPLORERS. By J. L. WILLSON and C. ROBB. 1s. 6d.
THE ORIGINAL LOCOMOTIVE BY TREVITHICK. On fine paper, 2s.
MINING GLOSSARY—English and Foreign Mining and Smelting Terms. (SECOND EDITION). 2s.
REMARKS ON THE GEOLOGY OF CORNWALL AND DEVON. By Capt. CHARLES THOMAS, of Dolcoath Mine, Cornwall. 1s. 6d.
FORM OF "TACK-NOTE." 5s.
VENTILATION OF COAL MINES. 3d.
GEOLOGICAL MAP OF THE CROWAN AND WHEAL ABRAHAM MINING DISTRICTS. By BRENTON SYMONS, M.E. Coloured, 15s.; mounted, 21s.
MINES OF CORNWALL AND DEVON (Statistics of, and Observations on), by T. SPARGO. 5s.; by post, 5s. 4d.
MASTERS AND WORKMEN. By MARK FRYAR. 6d.
CORNWALL AND DEVON MINING DIRECTORY. 1s. 6d.
CONVERSATION ON MINES, &c., BETWEEN "A FATHER AND SON." By W. HOPTON, Colliery Manager. 2s. 6d.; by post, 2s. 8d.
INVENTIONS, IMPROVEMENTS, AND PRACTICE, OF A COLLIERY ENGINEER AND GENERAL MANAGER. By BENJAMIN THOMPSON. 6s.

LONDON: Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors), at their office, 26, FLEET-STREET, where all communications are requested to be addressed. [June 24, 1865.